

WHAT IS CLAIMED IS:

1. An injection-molding apparatus comprises;  
(A) a mold assembly having a first-molten-resin injection portion for injecting a first molten thermoplastic resin into a cavity of the mold assembly, a second-molten-resin injection portion for injecting a second molten thermoplastic resin into the cavity, and a pressurized-fluid introducing portion for introducing a pressurized fluid into the second molten thermoplastic resin injected into the cavity, and  
(B) a first injection cylinder communicating with the first-molten-resin injection portion and a second injection cylinder communicating with the second-molten-resin injection portion.
2. The injection-molding apparatus according to claim 1, wherein the injection-molding apparatus further has a movable partition member to be positioned in a portion of the cavity between a first cavity portion that the first molten thermoplastic resin can occupy in the cavity and a second cavity portion that the second molten thermoplastic resin can occupy in the cavity.
3. The injection-molding apparatus according to claim 2, wherein one surface of the partition member has convexo-concave shapes.
4. The injection-molding apparatus according to claim 2, wherein the direction in which the partition member is movable is nearly at right angles with the direction of a pressure exerted on the partition member by the first molten thermoplastic resin injected from the first-molten-resin injection portion into the first cavity portion, the direction of a pressure exerted on the partition member by the second molten thermoplastic resin injected from the second-molten-resin injection

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portion into the second cavity portion, or the direction of a pressure exerted on the partition member by the pressurized fluid introduced from the pressurized-fluid introducing portion.

5. A method for injection-molding a molded article having a hollow portion by means of an injection-molding apparatus comprising;

(A) a mold assembly having a first-molten-resin injection portion for injecting a first molten thermoplastic resin into a cavity of the mold assembly, a second-molten-resin injection portion for injecting a second molten thermoplastic resin into the cavity, and a pressurized-fluid introducing portion for introducing a pressurized fluid into the second molten thermoplastic resin injected into the cavity, and

(B) a first injection cylinder communicating with the first-molten-resin injection portion and a second injection cylinder communicating with the second-molten-resin injection portion,

the method comprising the steps of;

(a) injecting the first molten thermoplastic resin from the first injection cylinder into the cavity through the first-molten-resin injection portion,

(b) initiating the injection of the second molten thermoplastic resin from the second injection cylinder into the cavity through the second-molten-resin injection portion, without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, concurrently with the start of injection of the first molten thermoplastic resin into the cavity, during the injection thereof or after completion of the injection thereof, and

(c) introducing the pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid introducing portion during the

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injection of the second molten thermoplastic resin into the cavity or after completion of the injection thereof, thereby to form the hollow portion inside the second thermoplastic resin.

6. The method according to claim 5, in which the first thermoplastic resin is in a molten state when the first thermoplastic resin comes in contact with the second molten thermoplastic resin in the step (c).

7. The method according to claim 5, in which a portion of the first thermoplastic resin which portion comes in contact with the second molten thermoplastic resin comes into a re-melted state due to the contact thereof with the second molten thermoplastic resin in the step (c).

8. A method for injection-molding a molded article having a hollow portion by means of an injection-molding apparatus comprising;

(A) a mold assembly having a first-molten-resin injection portion for injecting a first molten thermoplastic resin into a cavity of the mold assembly, a second-molten-resin injection portion for injecting a second molten thermoplastic resin into the cavity, and a pressurized-fluid introducing portion for introducing a pressurized fluid into the second molten thermoplastic resin injected into the cavity,

(B) a first injection cylinder communicating with the first-molten-resin injection portion and a second injection cylinder communicating with the second-molten-resin injection portion, and

(C) a movable partition member to be disposed in a portion of the cavity that portion is between a first cavity portion that the first molten thermoplastic resin can occupy in the cavity and a second cavity

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portion that the second molten thermoplastic resin can occupy in the cavity,

the method comprising the steps of;

(a) disposing the movable partition member in the portion of the cavity that portion is between the first cavity portion that the first molten thermoplastic resin can occupy in the cavity and the second cavity portion that the second molten thermoplastic resin can occupy in the cavity,

(b) injecting the first molten thermoplastic resin from the first injection cylinder into the first cavity portion through the first-molten-resin injection portion,

(c) extracting the partition member from the cavity,

(d) injecting the second molten thermoplastic resin into the portion of the cavity that the partition member occupied and the second cavity portion from the second injection cylinder through the second-molten-resin injection portion, and

(e) introducing the pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid introducing portion during the injection of the second molten thermoplastic resin or after completion of the injection thereof, thereby to form the hollow portion inside the second thermoplastic resin.

9. The method according to claim 8, in which in the step (c), the partition member is extracted from the cavity after the first thermoplastic resin is solidified to such an extent that the movement of the partition member does not impair the form of the first thermoplastic resin.

10. The method according to claim 8, in which in the step (d), a portion of the first thermoplastic resin

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which portion comes in contact with the second molten thermoplastic resin comes to be in a re-melted state due to its contact to the second molten thermoplastic resin.

11. The method according to claim 8, in which that surface of the partition member which is to come in contact with the first molten thermoplastic resin has convexo-concave shapes.

12. The method according to claim 8, in which the direction in which the partition member is movable is nearly at right angles with the direction of a pressure exerted on the partition member by the first molten thermoplastic resin injected from the first-molten-resin injection portion into the first cavity portion.

13. A method for injection-molding a molded article having a hollow portion by means of an injection-molding apparatus comprising;

(A) a mold assembly having a first-molten-resin injection portion for injecting a first molten thermoplastic resin into a cavity of the mold assembly, a second-molten-resin injection portion for injecting a second molten thermoplastic resin into the cavity, and a pressurized-fluid introducing portion for introducing a pressurized fluid into the second molten thermoplastic resin injected into the cavity,

(B) a first injection cylinder communicating with the first-molten-resin injection portion and a second injection cylinder communicating with the second-molten-resin injection portion, and

(C) a movable partition member to be disposed in a portion of the cavity that portion is between a first cavity portion that the first molten thermoplastic resin can occupy in the cavity and a second cavity portion that the second molten thermoplastic resin can occupy in the cavity,

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the method comprising the steps of;

(a) disposing the movable partition member in the portion of the cavity that portion is between the first cavity portion that the first molten thermoplastic resin can occupy in the cavity and the second cavity portion that the second molten thermoplastic resin can occupy in the cavity,

(b) injecting the second molten thermoplastic resin from the second injection cylinder into the second cavity portion through the second-molten-resin injection portion,

(c) introducing the pressurized fluid into the second molten thermoplastic resin in the second cavity portion from the pressurized-fluid introducing portion during the injection of the second molten thermoplastic resin into the second cavity portion or after completion of the injection thereof, thereby to form the hollow portion inside the second thermoplastic resin,

(d) extracting the partition member from the cavity, and

(e) injecting the first molten thermoplastic resin into the portion of the cavity that the partition member occupied and the first cavity portion from the first injection cylinder through the first-molten-resin injection portion.

14. The method according to claim 13, in which the step (d) is preceded by discharging of the pressurized fluid from the hollow portion formed inside the second thermoplastic resin.

15. The method according to claim 13, in which in the step (d), the partition member is extracted from the cavity after the second thermoplastic resin is solidified to such an extent that the movement of the partition member does not impair the form of the second thermoplastic resin.

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16. The method according to claim 13, in which in the step (e), a portion of the second thermoplastic resin which portion comes in contact with the first molten thermoplastic resin comes to be in a re-melted state due to its contact to the first molten thermoplastic resin.

17. The method according to claim 13, in which that surface of the partition member which is to come in contact with the second molten thermoplastic resin has convexo-concave shapes.

18. The method according to claim 13, in which the direction in which the partition member is movable is nearly at right angles with the direction of a pressure exerted on the partition member by the second molten thermoplastic resin injected from the second-molten-resin injection portion into the second cavity portion, or the direction of a pressure exerted on the partition member by the pressurized fluid introduced from the pressurized-fluid introducing portion.

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